Bay Delta−2100: Future Water Resources over the Bay Delta and Contributing Watersheds

Bryan C Weare

Public Comments

No public comments were received for this proposal.

Technical Synthesis Panel Review

Proposal Title

#0070: Bay Delta−2100: Future Water Resources over the Bay Delta and Contributing Watersheds

Final Panel Rating
inadequate

Technical Synthesis Panel (Primary) Review

TSP Primary Reviewer's Evaluation Summary And Rating:

Dr. Weare has proposed to generate detailed local hydroclimate scenarios for the CALFED water management community. Two of the mail reviewers view the proposal as timely and important, but the third reviewer has serious concerns with the proposed research, especially with respect to the applicants providing a range of scenarios that are needed to inform the planning process, and the applicants limited experience in river routing and hydrologic planning. The panel's primary reviewer sides with the third reviewer. The proposal is uninspiring −− it provides an engineering solution to an intellectual problem. The applicants simply propose to wire several models together, but they do not outline the methods they would use to characterize the uncertainty in each step of the modeling process. Some creativity is required here and is seriously lacking. CALFED will be better served if it invests in some of the other climate change proposals.

Additional Comments:

Dr. Weare has proposed to generate detailed local hydroclimate scenarios for the CALFED water management community. Two of the mail reviewers view the proposal as timely and important,

but the third reviewer has serious concerns with the proposed research, especially with respect to the applicants providing a range of scenarios that are needed to inform the planning process, and the applicants limited experience in river routing and hydrologic planning. The panel's primary reviewer sides with the third reviewer. The proposal is uninspiring -- it provides an engineering solution to an intellectual problem. The applicants simply propose to wire several models together, but they do not outline the methods they would use to characterize the uncertainty in each step of the modeling process. Some creativity is required here and is seriously lacking. CALFED will be better served if it invests in some of the other climate change proposals.

Technical Synthesis Panel (Discussion) Review

TSP Observations, Findings And Recommendations:

The external reviewers expressed a range of opinions about this proposal; however, the panel did not regard the two more positive reviews as sufficiently thorough or critical. While the applicants mentioned the need to address uncertainty in several parts of the proposal, they did not propose any specific creative methods for characterizing uncertainty. The climatological component of the project was deemed to be pedestrian and the component dealing with surface water hydrology was poorly documented and did not reference much of the relevant literature in this field. The panel was concerned that the applicants did not have sufficient expertise in the aspect of the proposal dealing with surface water hydrological models, making it unlikely that the project will produce valuable results.

Technical Review #1

proposal title: Bay Delta−2100: Future Water Resources over the Bay Delta and Contributing Watersheds

Review Form

Goals

Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the idea timely and important?

Comments	**The goals are quite clear and the project would be timely. Developing and evaluating high−resolution climate change predictions for the San Francisco Bay Delta out to year 2100 seems important for long−term planning of water resources, ecosystem health, and sustainability in general. The PIs will systematically downscale global model predictions of future climate, evaluating product quality at each stage.**
Rating	**very good**

Justification

Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full−scale implementation project justified?

Comments	**The study is justified. The global models used in predicting future climate change and the regional models used for downscaling are far from perfect, but the situation is unlikely to change significantly in the immediate future. So studies such as the one proposed cannot be deferred, specially, since the investigators will be evaluating the quality of products at each stage. The PIs have proposed to perform the regional evaluations using the state−of−the−art North American Regional Reanalysis,**

	as the target.
Rating	very good

Approach

Is the approach well designed and appropriate for meeting the objectives of the project? Is the approach feasible? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology, or approaches? Will the information ultimately be useful to decision makers?

Comments	The approach is well laid out and feasible. The results, specially, the products generated from the regional-scale river and lake-routing models will be very valuable for hydrological planning and impact assessment. The proposed used of NOAH (NOAA's recent land-surface model) in MM5 is a great idea, and will serve to enhance the quality of hydroclimate simulations and predictions, with downstream benefits.
Rating	excellent

Feasibility

Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives and within the grasp of authors?

Comments	The project is technically feasible and of manageable scope. The PIs are well positioned to march on given their prior experience with MM5. Not only has the investigative team run this model, they have to their credit several interesting publications as well. So there is good reason to expect a successful outcome.
Rating	very good

Monitoring

If applicable, is monitoring appropriately designed (pre−post comparisons; treatment−control comparisons)? Are there plans to interpret monitoring data or otherwise develop information?

Comments	**Not applicable**
Rating	**good**

Products

Are products of value likely from the project? Are contributions to larger data management systems relevant and considered? Are interpretive (or interpretable) outcomes likely from the project?

Comments	**Yes. As mentioned before, several high-resolution hydroclimate data sets depicting future climate change in the Bay area will be produced. The data sets will also be analyzed using various statistical techniques.**
Rating	**very good**

Additional Comments

Comments

Capabilities

What is the track record of authors in terms of past performance? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

Comments	**The lead PI is a well-regarded climate scientist with expertise and notable contributions in climate diagnostics, modeling, and climate-cloud interactions. The investigative team is productive, publishing cutting-edge research in top journals. They evidently have in-house resources to run the downscaling models, and the intellectual wherewithal to devise new analysis/evaluation techniques and research strategy, if/when necessary.**
Rating	**excellent**

Budget

Is the budget reasonable and adequate for the work proposed?

Comments	**The budget is quite reasonable given the scope of the project.**
Rating	**excellent**

Overall

Provide a brief explanation of your summary rating.

Comments	**I think this is a great project, bringing home scenarios of future climate change as manifest at local scales of interest. The best models are used and the PIs are seasoned. The emphasis placed on evaluation of derived data sets at every stage will add considerable value to the final product. The project will not only produce valuable data sets, but also perform interesting and important statistical analysis of the same. The budget is moreover quite reasonable. The project will foster graduate education and training as well.**
Rating	**excellent**

Technical Review #2

proposal title: Bay Delta−2100: Future Water Resources over the Bay Delta and Contributing Watersheds

Review Form

Goals

Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the idea timely and important?

Comments	**The goal of the work is to use a regional climate model to generation climate and hydrologic predictions out to 2100 for the Bay Delta. The idea is timely and important, but it is doubtful that output from one climate model will be useful to Bay Delta agencies and constituents in the planning process.** **The river routing model described in the "goals" section is not included in the "tasks" section.**
Rating	**fair**

Justification

Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full−scale implementation project justified?

Comments	**A successful multi−decade climate change study using RCM and multiple climate scenarios over a mid−sized domain at a daily (or less) timestep is still several years away. That such a model could successfully predict El Nino and other short−term climate oscillations is doubtful −− current GCM−based downscaled hydrologic models are unable to do this. At this stage, I am doubtful that an RCM would provide data any**

	more useful than macroscale models.
Rating	poor

Approach

Is the approach well designed and appropriate for meeting the objectives of the project? Is the approach feasible? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology, or approaches? Will the information ultimately be useful to decision makers?

Comments	While the approach is feasible and the results would be of some use to the academic community, the information generated in this study would be of limited use to decision makers. Climate and hydrologic predictions generated from one climate model, as proposed, do not provide the range of scenarios needed to inform the planning process.
Rating	fair

Feasibility

Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives and within the grasp of authors?

Comments	The proposal lacks enough development to determine if it is feasible. Assuming that it is feasible, the author has experience with the MM5 regional climate model. However, he does not have experience with river routing and hydrology or hydrologic planning. This, coupled with the fact that the funding is for him and two graduate students leads me to belief that transferring the climate information to a useful and implementable (by decision makers) streamflow network will be problematic.
Rating	fair

Monitoring

If applicable, is monitoring appropriately designed (pre−post comparisons; treatment−control comparisons)? Are there plans to interpret monitoring data or otherwise develop information?

Comments	
Rating	**not applicable**

Products

Are products of value likely from the project? Are contributions to larger data management systems relevant and considered? Are interpretive (or interpretable) outcomes likely from the project?

Comments	**A good RCM−generated streamflow network using multiple climate scenarios to 2100 would be incredibly useful. Sadly, only one climate scenario is promised and the author lacks experience generating hydrologic networks.**
Rating	**fair**

Additional Comments

Comments

Capabilities

What is the track record of authors in terms of past performance? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

Comments	**The author has experience with the MM5 regional climate model. However, he does not have experience with river routing and hydrology or hydrologic planning. This, coupled with the fact that the funding is for him and two graduate students leads me to belief that transferring the climate information to a useful and implementable (by decision makers) streamflow network will be problematic. There is an**

	excellent group of researchers at the author's academic institution (University of California at Davis) that specialize in water resources planning and management. If added to the project, they could be of enormous help, as they have dealt with similar issues (albeit at a coarser level of resolution) in the same geographic region.
Rating	**fair**

Budget

Is the budget reasonable and adequate for the work proposed?

Comments	**For RCM, it is acceptable. Hardware and networking resources are the most costly parts of this type of work.**
Rating	**very good**

Overall

Provide a brief explanation of your summary rating.

Comments	**The author raises some good areas of research, but the proposal lacks the detain or framework needed to convincingly convey that the scope of work is truly necessary and can be completed as promised. The author would be more successful teaming with other intellectual resources at the University of California at Davis who have direct experience with Bay Delta hydrology and water resources planning and resubmitting this proposal at a later date.**
Rating	**fair**

Technical Review #3

proposal title: Bay Delta−2100: Future Water Resources over the Bay Delta and Contributing Watersheds

Review Form

Goals

Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the idea timely and important?

Comments	**I view this effort to be a key piece of science that can contribute to effective deliberations and policy revisitation in the CALFED efforts. The latest suite of IPCC Assessment 4 model data is becoming available, and regional studies of the variety proposed here are very timely and important.**
Rating	**excellent**

Justification

Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full−scale implementation project justified?

Comments	**The proposed work is very well justified. The PI has laid out the strategy, as well as the inherent uncertainties in model physics as well as the climate scenarios, and these will need to be studied and understood, so as to make the best sense of the Bay−Delta climate scenario from this project. Prior work in this direction is a good pilot for assessing the potential success of the proposed effort.**
Rating	**excellent**

Approach

Is the approach well designed and appropriate for meeting the objectives of the project? Is the approach feasible? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology, or approaches? Will the information ultimately be useful to decision makers?

Comments	**The proposed approaches are reasonably well understood in the climate and hydrology community. I'd like to emphasize the import of assessing and understanding the potent role of uncertainties in providing the confidence and context for decision−making. It might be a good idea for the PIs to engage the CA water agencies at various stages of this project.**
Rating	**very good**

Feasibility

Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives and within the grasp of authors?

Comments	**I rate the likelihood of success of this project to be very good.**
Rating	**very good**

Monitoring

If applicable, is monitoring appropriately designed (pre−post comparisons; treatment−control comparisons)? Are there plans to interpret monitoring data or otherwise develop information?

Comments	**not applicable**
Rating	**not applicable**

Products

Are products of value likely from the project? Are contributions to larger data management systems relevant and considered? Are interpretive (or interpretable) outcomes likely from the

project?

Comments	**Results from this effort can provide useful body of knowledge to support planning and decision−making.** **Better interpretations of this work hinge upon the use of results from this project to resources models.**
Rating	**very good**

Additional Comments

Comments

Capabilities

What is the track record of authors in terms of past performance? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

Comments	**excellent**
Rating	**excellent**

Budget

Is the budget reasonable and adequate for the work proposed?

Comments	**excellent**
Rating	**excellent**

Overall

Provide a brief explanation of your summary rating.

Comments	**This is the kind of research that is needed to provide the science basis for CALFED 's management and policy into the future. Science of this variety is inherently uncertain, open−ended, and iterative. The proposed**

	work by the PI is a great first step, based on the best climate science results from the IPCC AR4 Climate Models. Continued work, like this project, that models and interprets results to scales relevant to decision context is the only way forward for a complex system, such as, CALFED.
Rating	**very good**